CLAIMS:

1. An electron-emitting device comprising a laminate comprising an insulating layer held between a pair of electrodes opposing each other, wherein an electron-emitting region insulated from said electrodes is formed at a side end surface of the insulating layer formed at the part at which the electrodes oppose each other, and electrons are emitted from said electron-emitting region by applying a voltage between said electrodes.

2. The electron-emitting device of Claim 1, wherein a pair of said electrodes, opposing each other at each end portion of the electrodes, hold said insulating layer without any overlap of said electrodes.

3. The electron-emitting device of Claim 1, wherein said electron-emitting region comprises a laminate comprising an insulating layer and a layer of an electron-emitting material.

4. The electron-emitting device of Claim 3, wherein said electron-emitting material is selected from the group consisting of borides, carbides, nitrides, metals, metal oxides, semiconductors, and

carbon.

5. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises at least two kinds of different materials.

6. The electron-emitting device of Claim 4, wherein said electron-emitting material is selected from the group consisting of Nb, Mo, Rh, Hf, Ta, W, Re, Ir, Pt, Ti, Au, Ag, Cu, Cr, Al, Co, Ni, Fe, Pb, Pd, Cs and Ba.

7. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises a metal oxide selected from the group consisting of In_2O_3, SnO_2, BaO, MgO and Sb_2O_3.

8. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises fine particles of Pd or SnO_2.

9. The electron-emitting device of Claim 1, wherein said electron-emitting region comprises a layer formed by incorporating an electron-emitting material in the insulating layer in a dispersed state.

carbon.

5. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises at least two kinds of different materials.

6. The electron-emitting device of Claim 4, wherein said electron-emitting material is selected from the group consisting of Nb, Mo, Rh, Hf, Ta, W, Re, Ir, Pt, Ti, Au, Ag, Cu, Cr, Al, Co, Ni, Fe, Pb, Pd, Cs and Ba.

7. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises a metal oxide selected from the group consisting of In_2O_3, SnO_2, BaO, MgO and Sb_2O_3.

8. The electron-emitting device of Claim 4, wherein said electron-emitting material comprises fine particles of Pd or SnO_2.

9. The electron-emitting device of Claim 1, wherein said electron-emitting region comprises a layer formed by incorporating an electron-emitting material in the insulating layer in a dispersed state.

10. The electron-emitting device of Claim 9, wherein said electron-emitting material is selected from the group consisting of borides, carbides, nitrides, metals, metal oxides, semiconductors, and carbon.

11. The electron-emitting device of Claim 10, wherein said electron-emitting material comprises at least two kinds of different materials.

12. The electron-emitting device of Claim 10, wherein said electron-emitting material is selected from the group consisting of Nb, Mo, Rh, Hf, Ta, W, Re, Ir, Pt, Ti, Au, Ag, Cu, Cr, Al, Co, Ni, Fe, Pb, Pd, Cs and Ba.

13. The electron-emitting device of Claim 10, wherein said electron-emitting material comprises a metal oxide selected from the group consisting of In_2O_3, SnO_2, BaO, MgO and Sb_2O_3.

14. The electron-emitting device of Claim 10, wherein said electron-emitting material comprises fine particles of Pd or SnO_2.

15. The electron-emitting device of Claim 1,

wherein an electron-emitting material is arranged on the side end surface of said insulating layer.

16. The electron-emitting device of Claim 15, wherein said electron-emitting material is selected from the group consisting of borides, carbides, nitrides, metals, metal oxides, semiconductors, and carbon.

17. The electron-emitting device of Claim 16, wherein said electron-emitting material comprises at least two kinds of different materials.

18. The electron-emitting device of Claim 16, wherein said electron-emitting material is selected from the group consisting of Nb, Mo, Rh, Hf, Ta, W, Re, Ir, Pt, Ti, Au, Ag, Cu, Cr, Al, Co, Ni, Fe, Pb, Pd, Cs and Ba.

19. The electron-emitting device of Claim 16, wherein said electron-emitting material comprises a metal oxide selected from the group consisting of In_2O_3, SnO_2, BaO, MgO and Sb_2O_3.

20. The electron-emitting device of Claim 16, wherein said electron-emitting material comprises fine

particles of Pd or SnO_2.

21. The electron-emitting device of Claim 1, wherein the one or both of a pair of said electrodes are in a multiple layer constitution.

22. The electron-emitting device of Claim 21, wherein at least one layer of the multiple layers is made of a material not readily damaged by ion sputtering.

23. The electron-emitting device of Claim 22, wherein said material comprises a high-melting material selected from the group consisting of W, LaB_6, carbon, TiC and TaC.

24. The electron-emitting device of Claim 21, wherein at least one layer of said multiple layers comprises a material exhibiting a low work function.

25. The electron-emitting device of Claim 24, wherein said material is selected from the group consisting of SnO_2, In_2O_3, BaO, LaB_6, Cs, and CsO.

26. The electron-emitting device of Claim 21, wherein at least one layer of said multiple layers

comprises a material having a high electrical conductivity.

27. The electron-emitting device of Claim 26, wherein said material is selected from the group consisting of Ag, Al, Cu, Cr, Ni, Mo, Ta, W, and an alloy of any of these.

28. An electron-emitting device comprising a laminate comprising an insulating layer interposing a layer in which an electron-emitting material is dispersed, and held between a pair of opposing electrodes, wherein said electrodes do not come into contact with the layer in which an electron-emitting material is dispersed; an end of said layer in which the electron-emitting material is dispersed is positioned at the side end surface of the insulating layer, formed at the part at which the electrodes oppose each other; and electrons are emitted by application of a voltage between said electrodes.

29. An electron-emitting device comprising a laminate comprising an insulating layer containing an electron-emitting material in a dispersed state and held between a pair of opposing electrodes, wherein;

a side end surface of the insulating layer is

formed at the part at which the electrodes oppose each other;

and electrons are emitted by application of a voltage between said electrodes.

30. An electron-emitting device comprising; a pair of opposing electrodes, holding therebetween a laminate comprising a layer in which an electron-emitting material is dispersed and an insulating layer; and an or the electron-emitting material provided on the side wall surface of the insulating layer, formed at the part at which the electrodes oppose each other; where electrons are emitted by application of a voltage between said electrodes.

31. An electron-emitting device comprising; a pair of opposing electrodes, holding therebetween an insulating layer containing an electron-emitting material in a dispersed state; and an or the electron-emitting material provided on the side wall surface of the insulating layer, formed at the part at which the electrodes oppose each other; where electrons are emitted by application of

a voltage between said electrodes.

32. An electron-emitting device comprising a device structure in which an insulating layer is formed between opposing electrodes, and fine particles are arranged inside the layer of said insulating layer in a dispersed state.

33. The electron-emitting device of Claim 32, having the structure in which said fine particles are completely included into said insulating layer.

34. The electron-emitting device of Claim 32, having the structure that any of said fine particles is partly included into and partly exposed from said insulating layer.

35. The electron-emitting device of Claim 32, wherein said fine particles is composed of a substance selected from the group sonsisting of borides, carbides, nitrides, metals, metal oxides, semiconductors, and carbon.

36. The electron-emitting device of Claim 32, wherein said fine particles are dispersed between the electrodes by coating.

37. The electron-emitting device of Claim 32, wherein said fine particles are dispersed between the electrodes by vacuum deposition.

38. The electron-emitting device of Claim 32, wherein said fine particles are dispersed by thermal decomposition of an organic metal compound.

39. The electron-emitting device of Claim 32, having the device structure in which the insulating layer is formed between the opposing electrodes on a substrate, and said fine particles are arranged inside the layer of said insulating layer in a dispersed state.

40. The electron-emitting device of Claim 39, wherein said opposing electrodes are formed on the insulating layer on a substrate, and said fine particles contained in said insulating layer are those obtained by dispersing the fine particles between said electrodes followed by baking.

41. The electron-emitting device of Claim 40, wherein said insulating layer comprises a low-melting glass.

42. The electron-emitting device of Claim 40, wherein said insulating layer has a film thickness of from several ten angstroms to several ten microns.

43. A method of preparing an electron-emitting device, comprising a step of forming electrodes on a substrate, and a step of coating a mixture of fine particles and an insulating material with a solvent between said electrodes, and a step of baking to form an insulating layer containing said fine particles.

44. A method of preparing an electron-emitting device, comprising a step of forming electrodes on a substrate, a step of dispersing fine particles between said electrodes, and a step of forming an insulating layer on said fine particles having been dispersed.

45. The method of Claim 44, wherein said insulating layer is a layer comprised of a substance selected from the group consisting of an oxide, a nitride, a carbide or an organic polymer.

46. The method of Claim 45, wherein said insulating layer has a film thickness of from several ten angstroms to several ten microns.

47. The electron-emitting device of Claim 32, comprising a substrate comprising a porous glass in which a metal or a metal oxide is deposited.

48. The electron-emitting device of Claim 32, comprising a colored glass containing metal colloid fine particles.

49. A method of preparing an electron-emitting device, comprising a step of bringing fine particles in an insulating layer to be completely included into the insulating layer, and a step of etching said insulating layer to bring the completely included fine particles partly exposed from the insulating layer.

50. A method of preparing an electron-emitting device, comprising a step of coating on a substrate an insulating layer containing fine particles followed by baking, and a step of forming electrodes on said insulating layer.

51. An electron-emitting device comprising the device structure that a semiconductor layer is formed between opposing electrodes, and fine particles are arranged inside the layer, or on the layer, of said

semiconductor layer in a dispersed state.

52. The electron-emitting device of Claim 51, having the structure that said fine particles are completely included into said semiconductor layer.

53. The electron-emitting device of Claim 51, having the structure that said fine particles are partly contained in said semiconductor layer and partly exposed therefrom.

54. The electron-emitting device of Claim 51, wherein said fine particles are made of a substance selected from the group consisting of borides, carbides, nitrides, metals, metal oxidse, semiconductors, and carbon.

55. The electron-emitting device of Claim 51, wherein said fine particles are dispersed between said electrode by coating.

56. The electron-emitting device of Claim 51, wherein said fine particles are dispersed between said electrode by vacuum deposition.

57. The electron-emitting device of Claim 51,

wherein said fine particles are dispersed by thermal decomposition of an organic metal compound.

58. The electron-emitting device of Claim 51, having the device structure in which the electrodes are formed on a substrate, the semiconductor layer is formed between said electrodes, and the fine particles are arranged inside the layer, or on the layer, of said semiconductor layer in a dispersed state.

59. A method of preparing electron-emitting device, comprising a step of forming electrodes on a substrate, and a step of coating between said electrodes a fine particle dispersion containing an organic binder followed by baking to effect dispersion of the fine particles.

60. The method of Claim 59, wherein said organic binder is selected from the group consisting of a butyral resins, acryl resins, vinyl chloride-vinyl acetate copolymers, phenol resins, nylons, polyesters and urethanes.

61. A method of preparing electron-emitting device, comprising a step of forming a semiconductor layer on a substrate, a step of forming electrodes on

said semiconductor layer, and a step of dispersing fine particles between said electrodes.

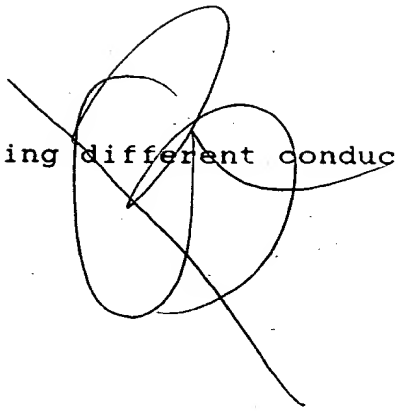
62. The method of Claim 61, wherein said semiconductor layer comprises a layer comprised of an amorphous silicon semiconductor, a crystallized silicon semiconductor, or a compound semiconductor.

63. The method of Claim 61, wherein said semiconductor layer has a film thickness of from 50 angstroms to 10 μm.

64. A method of preparing an electron-emitting device, comprising a step of bringing fine particles to be completely included into a semiconductor layer, and a step of etching said fine particles having been completely included into it to bring them to partly expose from said semiconductor layer.

65. An electron-emitting device comprising electrodes having minute spacing, between which at least two kinds of fine particles of different materials are arranged.

66. The electron-emitting device of Claim 65, wherein said different materials comprise materials



having different conductivity.